522.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

522.4 Measurement

This work is not measured separately for payment.

522.4.01 Limits

General Provisions 101 through 150.

522.5 Payment

This work will be paid for at the Contract Price for shoring complete in place, maintained, and removed.

Payment will be made under:

Item No. 522	Shoring	Per lump sum

522.5.01 Adjustments

General Provisions 101 through 150.

Section 523—Dynamic Testing of Pile

523.1 General Description

Specifications for this work will be included elsewhere in the Contract.

Section 524—Drilled Caisson Foundations

524.1 General Description

Specifications for this work will be included elsewhere in the Contract.

Section 525—Cofferdams

525.1 General Description

This work consists of designing, constructing, maintaining, dewatering, removing, and disposing of cofferdams, which are necessary for constructing substructures and for protecting personnel and adjacent structures, roadbeds, tracks, channels, slopes, or other property (public or private) whether on or off the Rights-of-Way from water, caving soil, and other dangers.

525.1.01 Definitions

General Provisions 101 through 150.

525.1.02 Related References

A. Standard Specifications

Section 109—Measurement and Payment

Section 211—Bridge Excavation and Backfill

Section 500—Concrete Structures

B. Referenced Documents

General Provisions 101 through 150.

525.1.03 Submittals

A. Drawings

The Engineer may require the Contractor to submit drawings of proposed cofferdams for review. If this is required, the Contractor shall not start work until the Engineer completes the review.

The review will not relieve the Contractor of the responsibility for providing an adequate and safe cofferdam.

525.2 Materials

Materials used in cofferdam construction may be of any type suitable for the design requirements and for the particular dam being constructed, subject to the Engineer's approval.

Earth dams, sand bags, or dams constructed using excavated materials are not considered cofferdam construction.

525.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

525.3 Construction Requirements

525.3.01 Personnel

General Provisions 101 through 150.

525.3.02 Equipment

A. Pumps

Supply sufficient pumping capacity to dewater the cofferdam.

525.3.03 Preparation

General Provisions 101 through 150.

525.3.04 Fabrication

General Provisions 101 through 150.

525.3.05 Construction

A. Designing Cofferdams

Cofferdams shall be structurally adequate to withstand external and internal forces including the following:

1. Forces and pressures from an excavation depth of not less than 6 ft (2 m) below the elevation of the bottom of the footing
2. Forces and pressures from surcharge loads from adjacent structures, roadbeds, tracks, slopes, and equipment.

Design the cofferdam to meet these conditions:

- Cofferdams shall permit placing pumping equipment outside the footing forms.
- Cofferdams shall permit driving piling between braces.
- Cofferdams shall be watertight to permit the construction of the footings, seals, or substructure.

B. Correcting Cofferdams

Correct to the Engineer's satisfaction cofferdams that tilt or move laterally during construction.

C. Lowering Cofferdams

Substructure elevations shown on the Plans are approximate; therefore, the Engineer may require that both substructures and cofferdams be lowered by a specified amount.

D. Dewatering Cofferdams

Try to dewater cofferdams without using seal concrete unless the Plans require seals.

1. Dewatering Cofferdams Without Seal Concrete

   Use all reasonable methods to provide a dewaterable enclosure, including the following:

   a. Drive all sheeting within the cofferdam to a depth of at least 1 ft (300 mm) below the bottom of the excavation.
   b. Provide a double-walled cofferdam lined with clay or other reasonably impervious material.

The Engineer decides if the Contractor has used all reasonable methods to provide watertight cofferdams.

If the enclosures are not dewaterable, and the Engineer decides the Contractor has not used all reasonable methods to provide watertight cofferdams, the Engineer may do either of the following:

- Require the Contractor to place Seal Concrete at the Contractor's expense.
- Permit the Contractor to place Seal Concrete at the Contractor's expense instead of trying further dewatering methods without a seal.

2. Dewatering Cofferdams with Seal Concrete

   If all reasonable methods to provide a dewaterable enclosure have been used and the Engineer determines that seal concrete is necessary, place the concrete as outlined in Subsection 500.3.05.V, "Place Seal Concrete."

   When using seal concrete, dewater the cofferdam no earlier than 24 hours after the concrete is placed unless the Engineer determines that a longer period is necessary.

E. Removing Cofferdams

Unless otherwise specified, completely remove all cofferdam material. This material shall remain the property of the Contractor.

525.3.06 Quality Acceptance

General Provisions 101 through 150.

525.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

525.4 Measurement

A. Measuring Cofferdams for Separate Payment

Cofferdams will be measured for separate payment only when set up as a Pay Item on the Plans.

Separate measurement will be made only for cofferdams constructed at the specific locations required on the Plans, regardless of cofferdams built at other locations within the limits of the structure and regardless of site conditions.

The Contractor may request permission to enclose more than one footing in a single cofferdam at a pay measurement location. If the Engineer approves, the number of cofferdams measured for payment will equal the number of footings enclosed within that single cofferdam.

If cofferdams are not set up as a Pay Item on the Plans and their use becomes necessary, they will not be measured for payment.

B. Measuring Lowered Cofferdams for Payment

The following restrictions apply to lowered cofferdams:

1. If lowering a footing requires lowering a separately measured cofferdam, lower the cofferdam enough distance to permit construction at an elevation not to exceed 6 ft (2 m) below Plan elevation at the Contractor's expense.
2. Any lowering of a cofferdam to permit construction at an elevation more than 6 ft (2 m) below Plan elevation will be paid for as Extra Work.
3. The Specifications intend that no Extra Work be paid for lowering a separately measured cofferdam until the Contractor completes the cofferdam to the extent that footings or substructure can be successfully constructed at an elevation no more than 6 ft (2 m) below Plan elevation.

   No Extra Work shall be done under this Item until the requirements of Subsection 109.05, "Extra Work" have been met.

525.4.01 Limits

General Provisions 101 through 150.

525.5 Payment

A. Cofferdams Measured for Separate Payment.

Each cofferdam eligible for separate measurement and payment will be paid for at the Contract Price per each, complete in place, maintained, dewatered, removed, and disposed of.

B. Cofferdams Not Measured for Separate Payment.

The cost of cofferdams not measured for separate payment will be included in the Contract Price for bridge excavation.

If lowering a footing requires lowering a cofferdam not measured for separate payment, the compensation for extra depth excavation provided for in Subsection 211.5.A, "Bridge Excavation", will be full compensation for the cost of lowering the cofferdam.

Payment for cofferdams eligible for separate measurement will be made under the following:

Item No. 525	Cofferdams	Per each

525.5.01 Adjustments

A. Partial Payment Adjustments

Partial payment for measured cofferdams will be made as follows:

1. After a satisfactory initial dewatering of the cofferdam, 75 percent of the Contract Price per cofferdam will be included in the next statement.
2. The remaining 25 percent will be included in the next statement after the satisfactory removal and disposal of the cofferdam.

B. Extra Work Qualifications

When the excavation elevation reaches 6 ft (2 m) below the Plan elevation and the cofferdam is satisfactory (as determined by the Engineer) for dewatering to that elevation, then any lowering of the cofferdam to permit construction at an elevation more than 6 ft (2 m) below Plan elevation will be considered Extra Work.

Section 528—Epoxy Pressure Injection of Concrete Cracks

528.1 General Description

This work consists of labor, material, equipment, and services necessary for repairing concrete cracks. The Plans will specify or the Engineer will determine the extent of repair. The work shall comply with the Specifications including Special Provisions where applicable.

528.1.01 Definitions

General Provisions 101 through 150.

528.1.02 Related References

A. Standard Specifications

Section 886—Epoxy Resin Adhesives

B. Referenced Documents

General Provisions 101 through 150.

528.1.03 Submittals

General Provisions 101 through 150.

528.2 Materials

Ensure epoxy used for crack repair complies with the requirements of Section 886, Type V epoxy adhesive.

Ensure epoxy used for sealing cracks at the surface is strong enough to withstand injection pressures up to 250 psi (2 MPa).

528.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.